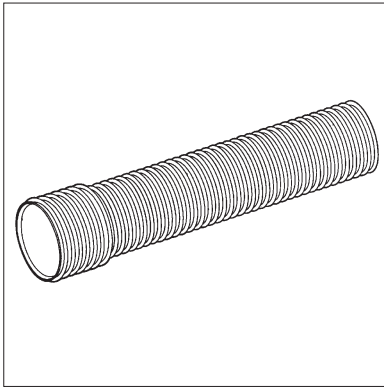


Product



• THIS DETAIL SHEET REPLACES DETAIL SHEET 3 AND RELATES TO OSMA ULTRARIB 150 mm, 225 mm AND 300 mm DIAMETER PIPES AND FITTINGS.

• Osma UltraRib pipes and fittings are for use in foul and surface water drains, and are suitable for use where pipes and fittings included in Table 5/1 of the Highways Agency Manual of Contract Documents for Highway Works (MCHW), Volume 1 and Volume 2, are normally used.

This Detail Sheet must be read in conjunction with the Front Sheet, which gives Conditions of Certification and the product's position regarding the Highways Agency requirements.

Technical Specification

1 Description

1.1 Osma UltraRib pipes have a solid wall and a repeating pattern of radial ribs perpendicular to the axis of the pipe. The ribs provide a housing for type WC elastomeric ring-seals to BS EN 681-1 : 1996.

1.2 The pipes, golden brown in colour, are extruded PVC-U produced in three diameters and with either plain ends (spigot x spigot) or with one end socketed (socket x spigot). Dimensions of pipes and pipe sockets are given in Tables 1 and 2.

1.3 Osma UltraRib fittings are golden brown in colour and are either injection moulded in PVC-U or polypropylene (PP), or thermomoulded in PVC-U. The sockets of each fitting are not ribbed. The body of the fittings is ribbed where appropriate. The range of fittings covered by this Detail Sheet is shown in Table 3.

1.4 Continuous quality control is exercised during manufacture to maintain product quality and includes checks for dimensional accuracy, impact resistance and weight of the pipes and for dimensional accuracy and stress relief on the fittings.

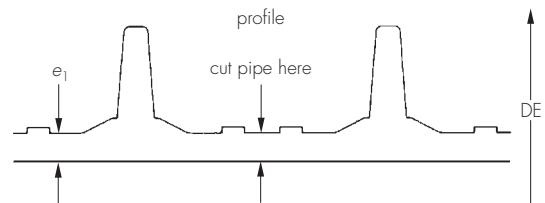
1.5 Each pipe length and fitting is engraved, marked or labelled with the Certificate holder's name, internal diameter, product code (fittings only) and the BBA identification mark and/or Certificate number.

2 Delivery and site handling

2.1 Handling, storage and transportation should be in accordance with BS 5955-6 : 1980.

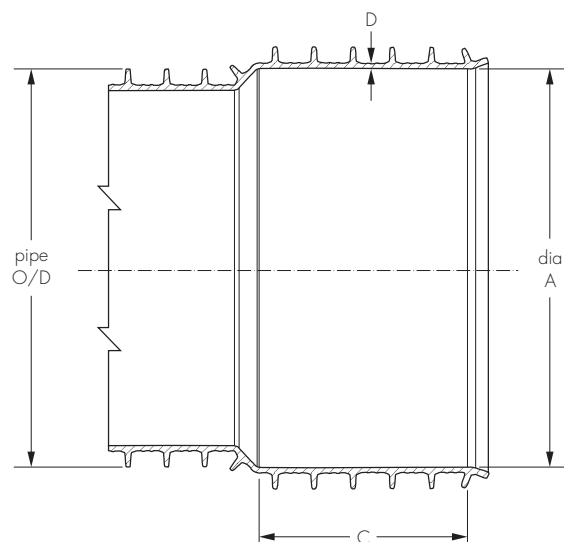
2.2 When long-term storage is envisaged, pipe and fittings must be protected from direct sunlight.

Table 1 Pipe dimensions



| Nominal size | Outside dia (DE) (mm) | Mean bore (mm) | Effective length (m) | Thickness (e_1) | | Mean weight (kgm ⁻¹) |
|--------------|--------------------------|-------------------|-------------------------|---------------------|-------------|-------------------------------------|
| | | | | nominal (mm) | min (mm) | |
| 150 | 170 | 152.0 | 3 to 6 | 1.9 | 1.5 | 2.1 |
| 225 | 250 | 226.0 | 3 to 6 | 2.3 | 1.9 | 4.5 |
| 300 | 335 | 301.0 | 3 to 6 | 2.9 | 2.3 | 7.0 |

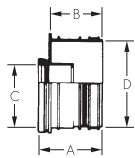
Table 2 Pipe socket dimensions



| Nominal size | Nominal pipe O/D (mm) | Socket inside dia A (mm) | | Socket depth C (mm) | Min wall thickness D (mm) |
|--------------|--------------------------|--------------------------|-------|---------------------|------------------------------|
| | | min | max | | |
| 150 | 170 | 170.5 | 171.6 | 83 | 1.3 |
| 225 | 250 | 250.8 | 252.0 | 100 | 1.6 |
| 300 | 335 | 336.1 | 337.6 | 110 | 1.9 |

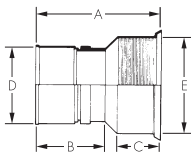
Table 3 Fittings

S/S level invert reducer (to OsmaDrain BS EN 1401-1 spigot)



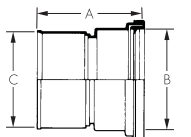
| Product code | Nominal size | Dimensions (mm) | | | |
|--------------|--------------|-----------------|----|-----|-----|
| | | A | B | C | D |
| 6UR099 | 150 x 110 | 115 | 95 | 111 | 170 |

S/S adaptor (to cast iron and clay spigot)



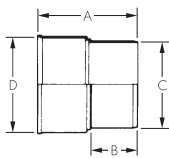
| Product code | Nominal size | Dimensions (mm) | | | | |
|--------------|--------------|-----------------|-----|----|-----|-----|
| | | A | B | C | D | E |
| 6UR128 | 150 | 275 | 154 | 95 | 170 | 216 |

D/S adaptor (to thinwall clay spigot)



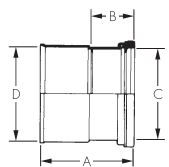
| Product code | Nominal size | Dimensions (mm) | | |
|--------------|--------------|-----------------|-----|-----|
| | | A | B | C |
| 6UR129 | 150 | 193 | 180 | 170 |

S/S adaptor (6UR socket x 160 mm BS EN 1401-1 spigot)



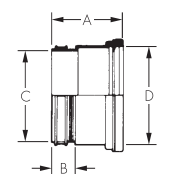
| Product code | Nominal size | Dimensions (mm) | | | |
|--------------|--------------|-----------------|----|-----|-----|
| | | A | B | C | D |
| 6UR141 | 150 | 180 | 84 | 160 | 170 |

D/S adaptor (6UR socket x 160 mm BS EN 1401-1 socket)



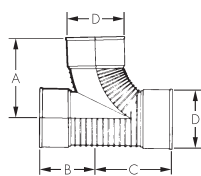
| Product code | Nominal size | Dimensions (mm) | | | |
|--------------|--------------|-----------------|----|-----|-----|
| | | A | B | C | D |
| 6UR142 | 150 | 170 | 76 | 161 | 170 |

S/S adaptor (6UR spigot x 160 mm BS EN 1401-1 socket)



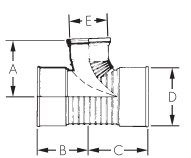
| Product code | Nominal size | Dimensions (mm) | | | |
|--------------|--------------|-----------------|----|-----|-----|
| | | A | B | C | D |
| 6UR143 | 150 | 121 | 42 | 161 | 161 |

D/S equal junction 87½° (to UltraRib spigot)



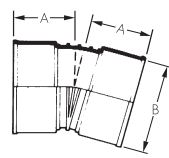
| Product code | Nominal size | Dimensions (mm) | | | |
|--------------|--------------|-----------------|-----|-----|-----|
| | | A | B | C | D |
| 6UR193 | 150 | 246 | 180 | 229 | 170 |

D/S unequal junction 87½° (to BS EN 1401-1 spigot)



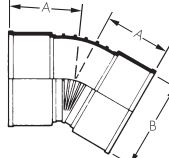
| Product code | Nominal size | Dimensions (mm) | | | | |
|--------------|--------------|-----------------|-----|-----|-----|-----|
| | | A | B | C | D | E |
| 6UR219 | 150 x 110 | 171 | 166 | 177 | 170 | 160 |

D/S short radius bends 15°



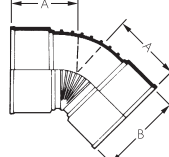
| Product code | Nominal size | Dimensions (mm) | |
|--------------|--------------|-----------------|-----|
| | | A | B |
| 6UR567 | 150 | 114 | 170 |
| 9UR567 | 225 | 232 | 225 |
| 12UR567 | 300 | 192 | 335 |

D/S short radius bends 30°



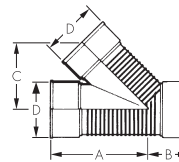
| Product code | Nominal size | Dimensions (mm) | |
|--------------|--------------|-----------------|-----|
| | | A | B |
| 6UR566 | 150 | 125 | 170 |
| 9UR566 | 225 | 150 | 250 |
| 12UR566 | 300 | 210 | 335 |

D/S short radius bends 45°



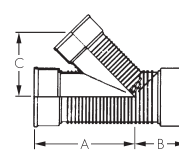
| Product code | Nominal size | Dimensions (mm) | |
|--------------|--------------|-----------------|-----|
| | | A | B |
| 6UR563 | 150 | 138 | 170 |
| 9UR563 | 225 | 168 | 250 |
| 12UR563 | 300 | 230 | 335 |

D/S equal junctions 45°



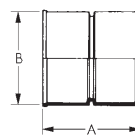
| Product code | Nominal size | Dimensions (mm) | | | |
|--------------|--------------|-----------------|-----|-----|-----|
| | | A | B | C | D |
| 6UR213 | 150 | 299 | 136 | 210 | 170 |
| 9UR213 | 225 | 495 | 162 | 345 | 250 |
| 12UR213 | 300 | 660 | 220 | 460 | 335 |

D/S unequal junctions 45°



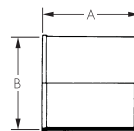
| Product code | Nominal size | Dimensions (mm) | | |
|--------------|--------------|-----------------|-----|-----|
| | | A | B | C |
| 6UR199 | 150 x 110 | 257 | 102 | 166 |
| 9UR224 | 225 x 110 | 340 | 198 | 250 |
| 9UR227 | 225 x 150 | 370 | 168 | 270 |
| 9UR226 | 225 x 160 | 370 | 168 | 270 |
| 12UR236 | 300 x 160 | 425 | 225 | 300 |
| 12UR237 | 300 x 150 | 425 | 225 | 300 |
| 12UR240 | 300 x 225 | 425 | 225 | 300 |

D/S pipe couplers with central register



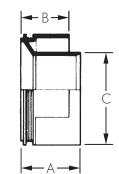
| Product code | Nominal size | Dimensions (mm) | |
|--------------|--------------|-----------------|-----|
| | | A | B |
| 6UR205 | 150 | 185 | 170 |
| 9UR205 | 225 | 241 | 250 |
| 12UR205 | 300 | 301 | 335 |

D/S slip couplers



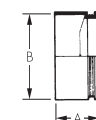
| Product code | Nominal size | Dimensions (mm) | |
|--------------|--------------|-----------------|-----|
| | | A | B |
| 6UR105 | 150 | 185 | 170 |
| 9UR105 | 225 | 269 | 250 |
| 12UR105 | 300 | 327 | 335 |

S/S reducers level invert



| Product code | Nominal size | Dimensions (mm) | | |
|--------------|--------------|-----------------|-----|-----|
| | | A | B | C |
| 9UR095 | 225 x 150 | 142 | 122 | 170 |
| 12UR093 | 300 x 225 | 165 | 155 | 250 |

Socket plugs



| Product code | Nominal size | Dimensions (mm) | |
|--------------|--------------|-----------------|--------------------|
| | | A | B |
| 6UR296 | 150 | 92 | 195 ⁽¹⁾ |
| 9UR296 | 225 | 110 | 250 ⁽¹⁾ |
| 12UR296 | 300 | 155 | 335 ⁽¹⁾ |

(1) Polypropylene (PP) fittings (all others are PVC)

Design Data

3 General

Osma UltraRib pipes and fittings are for use in highway drainage for the conveyance of surface water as is permitted to be discharged into public sewers by the Water Industry Act 1991, Chapter 56, the Sewerage (Scotland) Act 1968 and the Water and Sewerage Services (Northern Ireland) Order 1973.

4 Strength

4.1 The pipe can be used as an alternative to the plastics pipe for foul and surface water drains in Table 5/1 of the MCHW, Volume 1.

4.2 For the determination of safe bedding depth to Highways Agency Standards HA40, pipe may be assumed to have a standard dimension ratio (SDR) equivalent of not greater than 41.

4.3 Nominal short-term stiffness of pipe and fittings is not less than 8 kNm^{-2} and creep ratio ≤ 2.5 .

5 Performance of joints

5.1 Performance of correctly assembled joints will not be adversely affected by thermal expansion or contraction.

5.2 Joints in the pipeline remain watertight under conditions of pipeline movement in excess of those expected to occur in normal good drainage practice and comply with MCHW, Volume 1, Clause 504.3.

6 Flow characteristics

6.1 The products will have normal flow characteristics associated with PVC-U underground sewerage systems.

6.2 Full bore discharges and velocities are available from H R Wallingford and D I H Barr *Table for Hydraulic Design of Pipes, Sewers and Channels*, Volume 2, 7th edition. The values are based on the Colebrook-White equation.

7 Resistance to chemicals

7.1 The products are suitable for use where pipes and fittings included in the MCHW, Volume 1, Table 5/1, are normally used. They have adequate resistance to the type and quantities of chemicals likely to be found in surface water.

7.2 Details of the chemical resistance of PVC-U are given in CP 312-1 : 1973.

8 Practicability of installation

The products are light in weight and are installed easily under normal site conditions.

9 Rodding

9.1 Drains incorporating the product can be rodded easily using conventional flexible drain rods. Toothed root cutters, as used with some mechanical cleaning systems, could damage the pipes and fittings and these should not be used.

9.2 The system has adequate resistance to water cleansing using pressure jetting equipment. It is recommended that low-pressure, high-volume systems are utilised in accordance with MCHW, Volume 1, Clause 520.

10 Durability

In the opinion of the BBA, when used in the context of this Detail Sheet, no significant deterioration of the products will take place and installations will have a life equivalent to that of traditional PVC-U drainage systems.

Installation

11 General

Installation must be in accordance with the recommendations in the *Ultrarib Product Guide*, the general requirements and any additional specific site requirements (see section 1 of the Front Sheets of this Certificate).

12 Procedure

12.1 The pipe is cut midway between the small ribs as shown in Table 1.

12.2 Swarf is removed from the pipe end; a chamfer is not required.

12.3 Pipe spigots and sockets are cleaned and the sealing ring checked to ensure that it is correctly seated (not twisted) between the second and third ribs of the pipe end.

12.4 The manufacturer's lubricant is applied generously to the whole inside area of the socket, making sure that it does not subsequently become contaminated with dirt.

12.5 The pipe is offered to the socket, aligned and pushed fully home.

12.6 Jointing to other materials (clay or concrete pipe) must be carried out in accordance with the *Ultrarib Product Guide*.

12.7 Pipes and fittings must have adequate protection against damage from site traffic.

Technical Investigations

The following is a summary of the technical investigations carried out on the Osma UltraRib 150 mm, 225 mm and 300 mm Pipes and Fittings.

13 Tests

13.1 As part of the assessment leading to the issue of the original Detail Sheet for pipes and couplers, tests were carried out to determine:

- dimensional accuracy
- impact resistance to WIS/IGN No 4-31-05, Appendix A
- short-term stiffness to WIS/IGN No 4-31-05, Appendix B
- heat reversion to BS 5481 : 1977, Appendix A
- long-term stiffness to WIS/IGN No 4-31-05, Appendix D
- stress rupture to BS 4728 : 1971
- flexibility and pipe ring stiffness to WIS/IGN No 4-31-05, Appendix E
- effect of combined temperature and external load to WIS/IGN No 4-31-05, Appendix F
- Vicat softening point to BS 2782-1.120B : 1976
- resistance to penetration by simulated sharp aggregate.

13.2 Pipe, socketed pipe and couplers are Kitemarked to WIS 4-35-01.

13.3 Tests were carried out on fittings and joints between pipe and fittings to determine:

- drop test (fabricated fittings) to BS EN 12061 : 1999
- rodding resistance to MCHW, Volume 1, Clause 518.12
- mechanical strength and flexibility (fabricated fittings) to BS EN 12256 : 1998

- short-term stiffness to ISO 13967 : 1998
- dimensional accuracy to ISO 11922-1 : 1997
- leaktightness under angular deflection and diametric distortion to BS EN 1277 : 1996, Methods 4C and 4D
- ease of jointing
- combined temperature and external load to WIS 4-35-01, Appendix A.

14 Investigations

14.1 An evaluation of data was made to assess:

- resistance to cleansing using pressure jetting equipment
- practicability of installation
- chemical resistance
- design method
- flow capacities.

14.2 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 2782-1.120B : 1990 *Methods of testing plastics — Thermal properties — Determination of Vicat softening temperature of thermoplastics*

BS 4728 : 1971 *Method for determination of the resistance to constant internal pressure of thermoplastics pipe*

BS 5481 : 1977 *Specification for unplasticized PVC pipe and fittings for gravity sewers*

BS 5955-6 : 1980 *Plastics pipework (thermoplastics materials) — Code of practice for the installation of unplasticized PVC pipework for gravity drains and sewers*

BS EN 681-1 : 1996 *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Vulcanized rubber*

BS EN 1277 : 1996 *Methods of testing plastics — Thermoplastics pipes, fittings and valves — Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

BS EN 1401-1 : 1998 *Plastics piping systems for non-pressure underground drainage and sewerage.*

Unplasticized poly(vinylchloride) (PVC-U) — Specifications for pipes, fittings and the system

BS EN 12061 : 1999 *Plastics piping systems — Thermoplastics fittings — Test method for impact resistance*

BS EN 12256 : 1998 *Plastics piping systems — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*

CP 312-1 : 1973 *Code of practice for plastics pipework (thermoplastics material) — General principles and choice of material*

ISO 11922-1 : 1997 *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Metric series*

ISO 13967 : 1998 *Thermoplastic fittings — Determination of ring stiffness*

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, August 1998 (as amended)

Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works*, August 1998 (as amended)

Highways Agency Standards Design Manual for Roads and Bridges, Volume 4 *Geotechnics and Drainage*, Section 2 *Drainage*, HA40/01 *Determination of pipe and bedding combinations for drainage works*

WIS 4-35-01, Issue 1 : 2000 *Specification for thermoplastic structured wall pipes, joints and couplers with a smooth bore for gravity sewers for the size range 150 to 900 inclusive*

WIS/IGN No 4-31-05 *Specification for solid wall concentric external rib-reinforced uPVC sewer pipe*



On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'P. C. Newson'.

Date of issue: 17th December 2004

Chief Executive

British Board of Agrément

P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA

Fax: 01923 665301

©2004

e-mail: mail@bba.star.co.uk
website: www.bbacerfs.co.uk



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For information about the Agrément Certificate, including validity and scope, tel: Hotline 01923 665400, or check the BBA website.